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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/058,808
Filing Date: January 28, 2002
Appellant(s): POPE ET AL.

Jonathan A. Jaech
For Appellant

MAILED

JUL 28 2006

GROUP 1700

EXAMINER'S ANSWER

This is in response to the appeal brief filed 3/17/2006 appealing from the Office action mailed 9/27/04.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

While appellants do provide a correct summary of the claimed subject matter on page 3 of the brief, in which applicants correctly recite the limitations of claims 7 and 8, the Examiner would like to clarify one point. The third to the last line on page 2 states that the "invention is directed to a ceramic fiber product comprising or consisting of...". Nowhere in the claims are they limited by the phrase "consisting of". Both claims 7 and 8 use the open language "comprising".

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

1) Appellants summary of the issues 1. and 2. is incorrect. Claim 7 is not rejected separately under 35 USC 102(b) and 103(a). Rather the rejection is for **both** claims **7 and 8** under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Hilmas et al. The distinction is that these claims are rejected under a single 102/103 rejection. To separate the basis for these rejections as two distinct rejections is improper. See MPEP 2113, particularly the following:

"[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the

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statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972)..

Appellants summary of the issue 3. is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,399,378	Uemura et al.	3-1995
6,355,338	Hilmas et al.	3/2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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1. Claims 7 and 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hilmas et al.

The Examiner notes that the instant application is a continuation in part of 6,403,750, filed June 3, 1999. The claimed material, however, is not taught or suggested in the body of 6,403,750. As such the effective filing date for the claimed fiber is Jan. 28, 2002. As such Hilmas et al. qualifies as prior art under 35 USC 102(e).

Hilmas et al. teach the preparation of a filament. See column 5, lines 1 to 14.

Particular attention is drawn to the bottom of column 11, in which Example 1 prepares a hafnium carbide matrix having carbon fiber reinforcement. In this preparation, hafnium carbide, ethylene-ethyl acetate copolymer and an acryloid resin are admixed and heated. Both ethylene-ethyl acetate copolymer and acryloid resin are preceramic polymers. Since the polymers are mixed with hafnium carbide, the bottom of column 11 describes a hafnium containing pre-ceramic polymer. The "batch temperature" is 150°C. **This meets instant step a.**, in which a pre-ceramic polymer that contains hafnium is melted. This composition is then extruded (see the last lines of column 11 to the top of column 12). **This meets instant step b.** The composition is then subjected to pyrolysis (line 8, column 12).

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

In the instant application, there are two differences in the process taught by Hilmas et al. and that found in the process steps by which the claimed product is made.

First, Hilmas et al. do not specifically teach a step of crosslinking the fiber, but the Examiner notes that this is a product by process type claim and this limitation does not appear to lend any distinction to the final claimed product per se. The Examiner bases this position on the fact that the crosslinking step does not appear to result in a different product since the crosslinked polymer is subsequently pyrolyzed.

Also, while Hilmas et al. do not specifically teach heating at a temperature

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greater than 600 degrees under controlled atmospheric conditions, instant step d., patentees do teach pyrolyzing. The manner in which the pyrolyzing occurs would not have been expected to result in a patentably distinct product. The pyrolyzed fiber in Hilmas et al. appears to be inherently the same as that claimed.

The Examiner also draws attention to the claims in Hilmas et al. Claim 1 teaches a step of forming a feed of a "material laden polymer composition" (i.e. a preceramic polymer). In claim 7 of Hilmas et al. patentees specifically claim a hafnium carbide or hafnium diboride material. This is a hafnium containing preceramic polymer. This is extruded and formed into a filament (i.e. a fiber). The filament is then fired to remove the polymer (see claim 6). In this manner a fiber that appears to be the same as that claimed is prepared.

To support the Examiner's position that step c. does not inherently result in a patently distinct fiber, note that the step of firing (claim 6) removes the thermoplastic polymer. Since the polymer is subsequently removed upon firing, it does not appear that the step of crosslinking results in a different final product.

Please note that once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product.

For claim 8, note that both the ethylene-ethyl acetate copolymer and acryloid resin are preceramic polymers. Since hafnium carbide is the ceramic present in the final fiber in Example 1, this meets the requirement of a ceramic fiber derived from a preceramic polymer. As a formality the Examiner notes that this claim could have been rejected solely under 35 USC 102, as this rejection does not rely on a product by process rationale.

2. Claim 8 is rejected under 35 U.S.C. 102(b) as being anticipated by Uemura et al. Uemura et al. teach carbon fibers wherein a fiber is reacted with a compound

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and a carbide ceramic layer is formed on the fiber. See column 1, lines 45 to 55.

Column 2, line 13, teaches that HfC is a preferred carbide, and is formed by reacting the fiber with HfCl₄. The instant claim requires a ceramic fiber *comprising* hafnium carbide derived from a pre-ceramic polymer. The fiber in Uemura et al. has a ceramic layer and thus can be considered a ceramic fiber.

On one hand, the carbon fiber that subsequently becomes the hafnium carbide containing ceramic fiber is prepared from either a pitch based or polyacrylonitrile based fiber. In this regard a preceramic polymer (either pitch or polyacrylonitrile based fiber having a high elastic module as defined on column 1, lines 20 and on) is used to form a ceramic fiber comprising hafnium carbide and the requirements of claim 8 are met by the teachings in Uemura et al.

In addition to this, please note that the term "derived from" is open to any type of derivation and lends little descriptive weight to the claims. In view of the extreme breadth of the claim due to the term "derived from" the fibers in Uemura et al. anticipate that claimed.

(10) Response to Argument

1) With regard to the traversal over the Hilmas et al. reference, the Examiner does not understand appellants' logic starting on the last paragraph of page 7 of the brief. They argue that Hilmas fails to disclose or suggest melting a hafnium containing pre-ceramic polymer because Hilmas discloses hafnium *carbide* in a thermoplastic resin matrix. The phrase "hafnium containing" found in claim 7 is fully met by a hafnium carbide containing polymer. The Examiner does not understand why appellants believe that the acryloid resin in Hilmas et al. is not a pre-ceramic polymer. The Examiner can only assume that appellants are reading some sort of limitation into the term "hafnium containing preceramic polymer". It appears to the Examiner that such a limitation is completely met by a polymer that is not ceramic (i.e. acryloid resin) and contains hafnium carbide. It is the Examiner's opinion that adding the powder to the polymer

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prior to the melt step (as emphasized on the top of page 8 of the brief) DOES result in a hafnium containing pre-ceramic polymer.

Appellants then argue that Hilmas fails to disclose or suggest any step of cross-linking a hafnium containing polymer. Again, since the polymer is removed during the firing step (claim 6 in Hilmas) it is unclear how the occurrence of any crosslinking will result in a different final product. Appellants argue that “without adequate crosslinking, sublimation occurs during pyrolysis and ceramic yield is reduced” but they provide no evidence or support for this position. In addition, it is unclear how a reduced yield results in a structurally different final product, as it is the final product per se that is claimed.

As noted above, once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product.

Appellants have not met this burden.

Since appellants do not argue what the Examiner perceived to be a difference in the process steps, the heating conditions in step d. of claim 7, she assumes that appellants acquiesce this position.

Appellants finally argue that the ceramic product produced by the process of Hilmas is not a structural ceramic fiber as it must be carried by a core structural fiber, the Examiner notes that the presence of a fiber reinforcement is not excluded by the claims. The process by which the claimed fiber is prepared “comprises” the steps claimed and allows for fiber reinforcement. In addition “containing” found in claim 7 also allows for the presence of a fiber reinforcement.

In conclusion, the Examiner simply does not believe appellants have adequately established that the different processes result in a different product.

Since appellants did not include claim 8 in their issue, she notes that they do not provide specific a traversal for the rejection of claim 8 over Hilmas et al.

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2) With regard to the traversal over Uemura et al., the Examiner strongly disagrees with appellants' position that Uemura fails to teach any the three necessary elements to this claim. For the first part, the Examiner disagrees with appellants' position that a carbon fiber with a ceramic coating or layer cannot be considered a ceramic fiber. Uemura et al. teach fibers that have a ceramic constituent. Again note that the claims are drawn to a "ceramic fiber *comprising*..." which clearly allows for the carbon based fiber in Uemura et al. In effect the fiber in Uemura et al. is a multilayered fiber having an outer ceramic layer which is embraced by the term "ceramic fiber".

Appellants argue that the instant specification only shows examples of fibers made by "hydrolyzing" (the Examiner assumes that this term on the second line of the last paragraph on page 10 of the brief should be "pyrolyzing") an entire pre-ceramic polymer such that the end product consists substantially entirely of a ceramic material. In response note that 1) this is not consistent with the claim language and 2) it is unclear what the phrase "consists substantially entirely of..." actually embraces.

Appellants then state that Uemura does not teach a ceramic fiber comprising hafnium carbide but instead teaches a carbon fiber having a carbide layer. In response the Examiner notes that it is clear from the teachings and examples in Uemura et al. that the carbide layer is hafnium carbide. See column 2, lines 11 to 13, which states "the term heat resistant carbide as used herein includes... HfC" and "... of which ... HfC are preferred".

Finally appellants argue that Uemura fail to teach a ceramic fiber that is derived from a preceramic polymer, or from any other kind of polymer. This is not understood since a pitch based or polyacrylnitrile based fiber are based on, i.e. derived from, a polymer that has not yet been made ceramic. Again note the extreme breadth of the claims allowed by the term "derived". Any type of derivation can occur, and at any point in the preparation process, to meet this requirement.

In conclusion, it appears that appellants are reading more into the limitations of claim 8 than are actually found in the claim. As such this rejection is maintained.

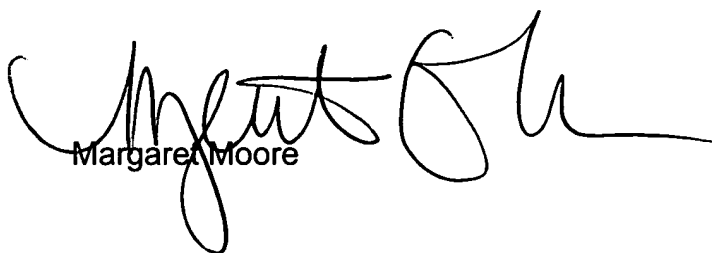
(11) Related Proceeding(s) Appendix

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No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

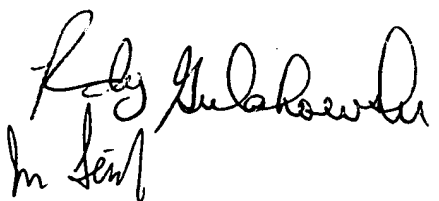
For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


Margaret Moore

Conferees:

Randy Gulakowski



James Seidleck

